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Committee for Co-ordination of Investigations of the Lower Me ong Basin

MEKONG PROJECT

FRENCH INVESTIGATION MISSION ON SEDIMENTATION OF THE GREAT LAKE

First Progress Report and Programme of Investigation for 1962

by

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No. 24/E

Bangkok, 23 May 1962.

Sir,

Further to my communication of 15 May 1962, I have the honour to transmit to you herewith the final text of the first report of the French investigation mission on sedimentation of the Great Lake. The report was prepared by the French experts, Mr. Carbonnel and Mr. Guiscafré.

I have the honour to be, etc.

(Signed) J.D. Paolini
Permanent Representative of France
to ECAFE

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FIRST PROGRESS REPORT AND PROGRAMME OF INVESTIGATION FOR 1962

The sedimentation investigation of the Great Lake has up to now consisted principally of a three months' mission entrusted to Mr. Dussart whose end-of-mission report has been published elsewhere.

That report revealed the lack of accurate data on the solid and liquid discharge of the affluents and outlets of the Great Lake. In the light of the experience gained during this preliminary mission it was decided to send a second mission consisting of Mr. Carbonnel, who has been in Cambodia for the past three months, and Mr. Guiscafré, who arrived in Phnom Penh last February.

SEDIMENTATION

During the past three months, Mr. Carbonnel has been principally in touch with:

The Fisheries Department

This department has put at the disposal of the mission a partially equipped laboratory. Besides using this laboratory for its own needs, the mission intends to train technical personnel in it.

The Public Works Department

There has been close cooperation between the mission and this department: Loan of a Trinity House Boat with a crew for the first survey operation on the Great Lake; installation of flood gauges.

The Department of Mines

This department has put at our disposal a trainee prospector to acquire specialized knowledge of sedimentation studies.

The Indian mission in Cambodia

In addition, three field trips on the Great Lake have enabled us to familiarize ourselves with the area and to take a series of samples in the Small Lake in particular, where 24 core-sampling stations have already been set up and analysis is in progress.

/With reference

With reference especially to the Plan of Operation dated 1 September 1961 (document E/CN.11/WRD/MKG/R.45 Rev. 3), which Mr. Carbonnel helped to draft, and to the programme submitted to the Committee on 30 December 1961 (document WRD/MKG/INF/L.77), the mission has established its survey programme as follows:

1. STRATIGRAPHY, SPEED OF SILTING-UP

This problem will be tackled by the established methods of sedimentology during the first stage. Approximately the first three weeks will be devoted to deep soundings (over 5 metres). These soudings will be carried out with special equipment now under construction.

The samples collected will later be analysed in a laboratory at Phnom Penh to the extent possible with the equipment and personnel available in the laboratory.

2. MAPPING OF SEDIMENTS IN THE GREAT LAKE AREA

Surface sediments in the Great Lake will be systematically sampled. The principal characteristics of these sediments will provide material for a bed-load facies map of the area.

3. MEASUREMENTS OF CURRENT AND SILT MOVEMENT

The current meter lent to us by the Port Authority of Sihanoukville will enable us to make an initial survey of the currents of the Great Lake, especially those caused by winds, which must be a factor in the distribution of silt during the dry season. We expect to continue this survey by procuring additional current meters and setting up one or more permanent measuring stations.

In connexion with item 1 of this programme and the survey of currents, we plan to establish an "experimental sedimentation area" in the Great Lake. This experiment, which will have to be continued for more than a year, will be carried out with a sediment granulometrically identical to the lacustrine sediment but of different composition to serve as a "marker". This will be undertaken only after items 1, 2 and 3 of this programme have yielded sufficient analytical data to justify such an experiment.

/4. SOLID

4. SOLID DISCHARGES

The total solid discharge of a stream or a river is composed of two very different elements:

a)- material in suspension

b)- drifting material

a) The material in suspension will be studied under the same sampling programme as the measurement of liquid discharge. The hydrologist following up the latter programme will take the required water samples.

The laboratory analysis will be carried out by us in the laboratory of the Fisheries Department.

b) A quantitative study of the drifting material will be much more delicate and will involve much more extrapolation than that of the material in suspension. It will be necessary either to collect these materials in "silt traps" (the disadvantages of which are well known), or to observe a given quantity of silt, different from the natural silt and introduced into the flow. Both methods will be used unless one proves to be more effective than the other.

The second method could, with great advantage, replace the study of sand movement in the Stung Sen with radioactive isotopes. The latter methods is very delicate and requires much costly and fragile equipment, as well as highly-skilled technicians, whereas the use of natural sand different in nature from the original silt requires little staff and involves laboratory techniques which can be learnt very quickly.

A much more rewarding method would be to make a further study of the natural radioactivity of the silt in the Great Lake at depth. This might yield interesting data on the absolute age of these silts, either from the C 14 of calcareous shells, or from the increased radioactivity at certain levels due to recent radioactive fallout. These methods although very delicate, could replace the classic methods of stratigraphy if the latter proved to be ineffective.

/This year,

This year, the mission has two aims in view:

- The establishment of a sedimentation laboratory and the specialized training of technical personnel;
- The creation of a network of observation stations on the Great Lake, the first data from which will guide further studies of sedimentation in the lake and facilitate the installation of permanent survey stations in the future.

HYDROLOGY

Mr. Guiscafré, a hydrological expert, has now been in Cambodia for a month. He has been in touch principally with:

- the Department of Public Works, Sub-Department of Hydrology and Navigation;
- the Harza International Engineering Company;
- the Indian Mission in Cambodia.

In the course of two field trips he acquainted himself with the terrain and visited the main staff gauge stations.

With special reference to the covering letter of document WRD/MKG/INF/L.77 dated 30 December 1961, the mission has drawn up the following programme:

I. METEOROLOGICAL DATA

A. Rainfall measurement

Collection of data

B. Evaporation

a) Collection of data on evaporation collected by the Meteorological Department, USOM and HARZA.

b) Installation of floating evaporation gauges on the Great Lake.

/II. HYDROLOGICAL DATA

II. HYDROLOGICAL DATA

A. Collection of available data on liquid discharges of the Tonle Sap and the main Stungs of the Great Lake already studied by other organizations (USOM, HARZA).

B. Measurement and study of discharge in other major affluents and outlets of the Great Lake.

C. Tentative estimate of additional discharges feeding the Great Lake and a study of their effect.

D. Tentative hydrological balance of the Great Lake.

E. Determination of the volume of the Lake at different levels.

III. SOLID DISCHARGES

The water samples required for the study of solid discharge in suspension in the various Stungs will be taken simultaneously with the measurement of liquid discharge.

The studies entrusted to this mission will have to be conducted in close cooperation with Cambodian hydrologists to avoid duplication and to obtain the best results.